

is used and applied as the buffer tube is being re-spooled through a second buffer tube tensioner 53'. The function used may be the same or different than that used for the first spooling of the buffer tube and the same or different methodology may be applied in the re-spooling process. For example, the tension on the tube may be monotonically decayed during the initial spooling of the buffer tube 42, and during the re-spooling of the buffer tube (if necessary) the angular velocity of the second spool may be functionally changed (instead of the tension applied) to correct any existing EFL error depending on the amount and type of correction needed. It should be noted that the present invention is not limited to the above example, and any combination of the previously discussed methods may be used to correct the tube EFL during the second spooling stage.

These additional features of the present invention are optional and may not be needed in all circumstances, depending on the manufacturing and production needs and characteristics. The heater 56 and secondary tensioner 53' are optional and are not required. Additionally, a single angular velocity controller 54 may be used to control both spools 44, 44', or individual controls may be used if such a configuration is more feasible. Additionally, it may be beneficial to use a stiffness compliant pad 45 on both the first 44 and secondary 44' spool depending on the methodology used to correct any error in buffer tube EFL.

Further, it is also known from experiments, that multiple re-spooling even under constant tension and ambient temperature often improve optical performance of the cables and buffered fibers presumably due to reduction in the micro-stress and micro-adjustment of the fiber position. Therefore, the present invention is not limited to only a first re-spooling of the tubes, but may be used with a multiple re-spooling where some of the disclosed methods of correcting EFL (discussed previously) may or may not be used.

It is of course understood that departures can be made from the preferred embodiments of the invention by those of ordinary skill in the art without departing from the spirit and scope of the invention that is limited only by the following claims.

It is further understood that the present invention is not limited to the manufacture of
5 fiber optic buffer tubes, but can be applied to any other industry or application where long lengths of material is wound on spools or reels and it is desired to control, or reduce the adverse effects of, residual stresses and strains in the rolled or wound materials.